TRANSACTIONS

OF THE

AMERICAN SOCIETY OF CIVIL ENGINEERS

INDEX

VOLUME 125, PART I

1960

SUBJECT INDEX, PAGE 1447

AUTHOR INDEX, PAGE 1466

Titles of papers are in quotation marks when given with the author's name.

VOLUME 125, PART I

SUBJECT INDEX

AERATION
See also OXYGENATION
"Self-Aerated Flow in Open Channels," Lorenz G. Straub and Alvin G. Anderson (with discussion), 456.
AIR ENTRAINMENT
See WATER, FLOW OF...
ALLUVIATION
See SEDIMENT AND SEDIMENTATION; SILT AND SILTING...
AMERICAN SOCIETY OF CIVIL ENGINEERS (General)
"Progress in ASCE,": Annual Address at the Convention, Reno, Nevada, June 22, 1960, Frank A. Marston, 1380.
Addresses
1960—Annual Address at the Convention, Reno, Nevada, June 22, 1960, Frank A. Marston, 1380.
Memoirs of Members
See name of member in Author Index. (*See also* p. 1393)
ANALOGS AND ANALOGIES
See under relative subject, e.g., MODELS; STRUCTURES, THEORY OF
ANALYSIS, DESIGN
See under relative subject, e.g., CONCRETE—Design
ARCHES
See also DAMS, ARCH; STRESS AND STRAIN—Arches; STRUCTURES, THEORY OF...
"Arch Dams": A Symposium, Manuel Rocha, J. Laginha Serafim, and Antonio F. da Silveira; Carlo Semenza; and Dino Tonini (with discussion), 909.
"Digital Computation for Stiffness Matrix Analysis," John S. Archer, 1.
ATOMIC BLAST
"Blast Phenomena from a Nuclear Burst," Ferd E. Anderson, Jr., 667.
"Digital Computation for Stiffness Matrix Analysis," John S. Archer, 1.
BARGES
"Construction of the Variable-Angle Launcher," Arthur C. Bravo, 181.
BASIN
"Forces Induced on a Large Vessel by Surge," John T. O'Brien and David I. Kuchenreuther (with discussion), 855.
BEAMS (General)
See also BUCKLING; GIRDERS; STRESS AND STRAIN—Beams; STRUCTURES, THEORY OF—Beams and Girders; *also* under structure or structural part, e.g., BRIDGES; COLUMNS; GIRDERS... *also* under name of material, e.g., CONCRETE.
"Concrete Beams and Columns with Bundled Reinforcement," Norman W. Hanson and Hans Reiffenstuhl (with discussion), 889.
"Inelastic Buckling in Steel," Geerhard Haaijer and Bruno Thurlimann (with discussion), 308.
"Moments in Beams by the Method of Partial Moments," Harry Posner, with discussion, 430. *Discussion:* William S. Walker and Joseph T. Kolibal; Anatol A. Eremin; Lembit Kald; and Harry Posner; 451.
"Numerical Solutions for Beams on Elastic Foundations," Henry Malter, 757. *Discussion:* Norman J. Ryker, Jr.; Alexander Dodge; Lymon C. Reese; Victir R. Bergman; and Henry Malter, 770.
"Numerical Solutions for Interconnected Bridge Girders," Henry Malter (with discussion), 365.
"Strength of Reinforced Concrete Beams," Sidney A. Guralnick, 603. *Discussion:* Henry J. Cowan; Robert F. Warner; Bela Goschy and George Balazs; Kuang-Han Chu; and Sidney A. Guralnick, 633.
BEAMS, CONTINUOUS
See also STRESS AND STRAIN—Beams, Continuous; STRUCTURES, THEORY OF—Beams and Girders, Continuous; STRUCTURES, THEORY OF—Frames, Continuous.
"Digital Computation for Stiffness Matrix Analysis," John S. Archer, 1.
"Elasti-Plastic Analysis of Continuous Frames and Beams," Lawrence P. Johnson, Jr., and Herbert A. Sawyer, Jr. (with discussion), 1176.
"Torque-Loaded Continuous Beams of Profile Section," Donovan H. Young and John F. Brahtz, 846.
BEARING CAPACITY (foundations, rocks, soils)
For more general interpretation *see* cross references under LOAD.
BED LOAD
See CHANNELS; RIVERS; SILT AND

BED LOAD (continued)
SILTING . . . ; TURBULENCE; WATER, FLOW OF, IN OPEN CHANNELS
BENDING
See under relative structure, structural part, or material, e.g., GIRDERS
BIOGRAPHIES OF DECEASED MEMBERS
See cross reference under MEMOIRS OF DECEASED MEMBERS. *See also* p. 1393)
BLAST, ATOMIC
See ATOMIC BLAST
BLASTING
"Garrison Dam Test Tunnel": A Symposium, Harris H. Burke, and Kenneth S. Lane (with discussion), 228.
BOW GIRDERS
See GIRDERS
BRACING
See WIND BRACING
BRIDGE APPROACHES
"Design Features of the George Washington Bridge Lower Deck," Irvine P. Gould, 1022.
BRIDGE FLOORS AND FLOORING
See STRESS AND STRAIN—Bridge Floors and Flooring
BRIDGES (General)
See also BEAMS . . . ; GIRDERS; STRESS AND STRAIN—Bridges . . . ; STRUCTURES, THEORY OF—Bridges; TRAFFIC, BRIDGE; TRUSSES
"Construction of the Variable-Angle Launcher," Arthur C. Bravo, 181.
"Design Features of the George Washington Bridge Lower Deck," Irvine P. Gould, 1022.
"Numerical Solutions for Interconnected Bridge Girders," Henry Malter (with discussion), 365.
BRIDGES, GIRDER
"Numerical Solutions for Interconnected Bridge Girders," Henry Malter (with discussion), 365.
BRIDGES, SUSPENSION
See also STRESS AND STRAIN—Bridges, Suspension
"Design Features of the George Washington Bridge Lower Deck," Irvine P. Gould, 1022.
BRIDGES, TRUSS
See also STRESS AND STRAIN—Bridges, Truss; TRUSSES
"Construction of the Variable-Angle Launcher," Arthur C. Bravo, 181.
"Design Features of the George Washington Bridge Lower Deck," Irvine P. Gould, 1022.
BRIDGE TRAFFIC
See TRAFFIC, BRIDGE
BUCKLING
"Amplified Stress and Displacement in Guyed Towers," Robert S. Rowe, (with discussion), 199.
"Inelastic Buckling in Steel," Geerhard Haaijer and Bruno Thurlimann, 308. *Discussion:* P. P. Bjilaard; and Geerhard Haaijer and Bruno Thurlimann, 338.
"Lateral Bracing of Columns and Beams," George Winter, 807. *Discussion:* Anthony A. Chibaro; Giles G. Green; Bruce G. Johnston; Marvin A. Larson; William Zuk, 826.
"Torque-Loaded Continuous Beams of Profile Section," Donovan H. Young and John F. Brahtz, 846.
BUILDINGS
See also STRUCTURES . . .
"Digital Computation for Stiffness Matrix Analysis," John S. Archer, 1.
CANALS (General)
See also CHANNELS; COSTS, CANAL; EROSION; STREAM; IRRIGATION CANALS (cross reference thereunder); SEDIMENT AND SEDIMENTATION; SEEPAGE; SILT AND SILTING, CHANNEL; WATER, FLOW OF IN OPEN CHANNELS; WATERWAYS; WAVES
"Lower-Cost Canal Lining Practice," Richard J. Willson, with discussion, 487.
"Stability of Coastal Inlets," Per Brun and Frans Gerritsen (with discussion), 1228.
CANAL LININGS
"Lower-Cost Canal Lining Practice," Richard J. Willson, 487. *Discussion:* Frederick L. Hotes; and Richard J. Willson, 500.
CHANNEL LININGS
"Resistance Properties of Sediment-Laden Streams," Vito A. Vanoni and George N. Nomicos (with discussion), 1140.
CHANNELS (waterways)
See also EROSION, STREAM; RIVERS; SILT AND SILTING, CHANNEL; WATER, FLOW OF, IN OPEN CHANNELS
"Delta Project" A Symposium, Johannes B. Schijf; J. J. Dronkers; and H. A. Ferguson (with discussion), 1267.
"Resistance Properties of Sediment-Laden Streams," Vito A. Vanoni and George N. Nomicos (with discussion), 1140.
"Self-Aerated Flow in Open Channels," Lorenz G. Straub and Alvin G. Anderson (with discussion), 456.
"Stability of Coastal Inlets," Per Brun and Frans Gerritsen (with discussion), 1228.
CHEMISTRY
See under relative technical subject, e.g., EARTHWORK

CITIES
See also CITY PLANNING; EXPRESSWAYS, (cross reference thereunder); REGIONAL PLANING; SEWAGE . . .; SEWERS (cross reference thereunder); TRAFFIC . . .; ZONING
"Freeways in Urban Planning," Harold M. Lewis (with discussion), 1072.
"Hydrology of Urban Runoff," A. L. Tholin and Clint J. Keifer (with discussion), 1308.
CITY PLANNING (General)
See also HIGHWAYS AND ROADS
"Freeways in Urban Planning," Harold M. Lewis (with discussion), 1072.
CIVIL ENGINEERS AND ENGINEERING
See AMERICAN SOCIETY OF CIVIL ENGINEERS; ENGINEERS AND ENGINEERING (and cross references thereunder)
CLAY
See also SOIL . . .; STRESS AND STRAIN—Clay (cross reference thereunder)
"Compacted Clay": A Symposium, T. William Lambe, 681. *Discussion:* D. Hugh Trollope; B. P. Warkentin and Raymond N. Y. Yong; Gerald A. Leonards; D. P. Krynine; Dean R. Freitag; and T. William Lambe; Alfred C. Scheer; Raymond N. Y. Yong and B. P. Warkentin; J. MacNeil Turnbull; Jose A. Jimenez Salas; D. Hugh Trollope; and T. William Lambe, 706, 741.
"Clay Strength Increase Caused by Repeated Loading," H. Bolton Seed, Robert L. McNeill, and Jacques de Guenin, 141. *Discussion:* Richard G. Ahlvin; D. Hugh Trollope; and H. Bolton Seed, Robert L. McNeill, and Jacques de Guenin, 161.
"Design and Performance of Vermilion Dam," Karl Terzaghi and Thomas M. Leps, (with discussion), 63.
"Garrison Dam Test Tunnel": A Symposium, Harris H. Burke, and Kenneth S. Lane (with discussion), 228.
"Geotechnical Properties of Glacial Lake Clays," Tien H. Wu, 994. *Discussion:* T. Cameron Kenney, 1012.
COFFERDAMS
"Cellular Cofferdams and Docks," Edward M. Cummings, 13. *Discussion:* Samuel Heyman; Cevdet Z. Erzen; and Edward M. Cummings, 34.
First cellular cofferdam was constructed at Black Rock Harbor, near Buffalo, N.Y. in 1908, 13.
COLUMNS
See also BUCKLING; STRUCTURES, THEORY OF—Columns; *also* under name of material, e.g., STEEL
"Concrete Beams and Columns with Bundled Reinforcement," Norman W. Hanson and Hans Reiffenstuhl (with discussion), 889.
"Inelastic Bucling in Steel," Geerhard Haaijer and Bruno Thurlimann (with discussion), 308.
COMPACTION
See BEARING CAPACITY (cross reference thereunder); SOILS
COMPRESSION
See STRESS AND STRAIN
COMPUTATION AND COMPUTERS
See also ELECTRONIC INSTRUMENTS
"Digital Computation for Stiffness Matrix Analysis," John S. Archer, 1.
"Hydraulic Problem Solution on Electronic Computers," Edward A. Lawler and Frank V. Druml, 517.
COMPUTERS, ANALOG
See ELECTRONIC INSTRUMENTS; *also* under relative subject
COMPUTERS, ELECTRONIC
See COMPUTATION AND COMPUTERS; ELECTRONIC INSTRUMENTS; *also* under relative subject
CONCRETE (General)
See also FAILURES, CONCRETE; STRESS AND STRAIN—Concrete; STRUCTURES, THEORY OF—Concrete Reinforced; *also* special structure or structural part, e.g., BEAMS; COLUMNS
"Concrete Beams and Columns with Bundled Reinforcement," Norman W. Hanson and Hans Reiffenstuhl (with discussion), 889.
"Construction of the Variable-Angle Launcher," Arthur C. Bravo, 181.
Construction
See also under specific structure, e.g., TUNNELS
"Construction of the Variable-Angle Launcher," Arthur C. Bravo, 181.
"Garrison Dam Test Tunnel": A Symposium, Harris H. Burke, and Kenneth S. Lane (with discussion), 228.
Cracks and Cracking
"Concrete Beams and Columns with Bundled Reinforcement," Norman W. Hanson and Hans Reiffenstuhl (with discussion), 889.
"Strength of Reinforced Concrete Beams," Sidney A. Guralnick (with discussion), 603.
Design
"Strength of Reinforced Concrete Beams," Sidney A. Guralnick, (with discussion), 603.
Linings
See under structure, e.g., CANAL LININGS
CONNECTORS AND CONNECTIONS
See also JOINTS . . .; WELDS AND WELDING

CONNECTORS AND CONNECTIONS (continued)
"Welded Pipeline Branch Connections," Everett C. Rodabaugh and Henry H. George, 554.
CONSTRUCTION
See also CONCRETE—Construction; MATERIALS OF CONSTRUCTION; STRESS AND STRAIN . . . ; STRUCTURES, THEORY OF . . . ; *also* under type of construction, e.g., TUNNELS
"Ambuklao Rock-Fill Dam, Design and Construction," E. Montford Fucik and Robert F. Edbrooke (with discussion), 1207.
"Construction of the Variable-Angle Launcher," Arthur C. Bravo, 181.
"Factor of Safety in Design of Timber Structures," Lyman W. Wood (with discussion), 1033.
"Garrison Dam Test Tunnel": A Symposium, Harris H. Burke, and Kenneth S. Lane (with discussion), 228.
"Trends in Pipeline Construction," James W. Hall, 123.
Variable-angle torpedo launcher permits study of water-entry performance p. 181.
CONSTRUCTION OF MATERIALS
See MATERIALS OF CONSTRUCTION
COSTS, CANAL
"Lower-Cost Canal Lining Practice," Richard J. Willson (with discussion), 487.
COSTS, CANAL (IRRIGATION CANALS)
"Lower-Cost Canal Lining Practice," Richard J. Willson (with discussion), 487.
COSTS, PIPE LINE
See under relative subject, e.g., PIPE LINES
COSTS, RESERVOIR
"Distribution of Sediment in Large Reservoirs," Whitney M. Borland and Carl R. Miller, 166.
COSTS, RESERVOIR (MULTI-PURPOSE RESERVOIRS)
"Distribution of Sediment in Large Reservoirs," Whitney M. Borland and Carl R. Miller, 166.
COSTS, SEDIMENT DISPOSAL
"Distribution of Sediment in Large Reservoirs," Whitney M. Borland and Carl R. Miller, 166.
COSTS, WATER CONSERVATION
"Lower-Cost Canal Lining Practice," Richard J. Willson (with discussion) 487.
"Water-A Limiting Resource," Robert O. Thomas (with discussion), 101.
COSTS, WATER POLLUTION CONTROL
"Sleuthing the Behavior of a River," Edward J. Cleary, (with discussion), 1053.
COSTS, WATER POWER
"Water-A Limiting Resource," Robert O. Thomas (with discussion), 101.
CRACKS AND CRACKING
See under relative subject, e.g., CONCRETE—Cracks and Cracking
CURVES (design curves)
See relative subject of design, e.g., GIRDERS; SEDIMENT AND SEDIMENTATION
CURVES (elastic curves)
See STRUCTURES, THEORY OF
CURVES (graphic curves)
See GRAPHICAL CHARTS
CUTOFFS (General)
See DAMS
DAMPING
See STRESS AND STRAIN
DAMS (General)
See also FOUNDATIONS, DAM; GROUND WATER; LOCKS; MODELS, HYDRAULIC; RESERVOIRS . . . ; SPILLWAYS; STRESS AND STRAIN—Dams (General); STRUCTURES, THEORY OF—Dams
"Ambuklao Rock-Fill Dam, Design and Construction," E. Montford Fucik and Robert F. Edbrooke (with discussion), 1207.
"The Columbia River Controlled," Louis H. Foote, (with discussion), 583.
"Distribution of Sediment in Large Reserviors," Whitney M. Borland and Carl R. Miller, 166.
"Underseepage Control at Fort Randall Dam," Stanley T. Thorfinnson, 792.
DAMS, ARCH
See also STRESS AND STRAIN—Dams, Arch
"Arch Dams": A Symposium, Manuel Roccha, J. Laginha Serafim, and Antonio F. da Silveira; Carlo Semenza; and Dino Tonini, 909. *Discussion:* Robert E. Glover, and Fred A. Houck, 949.
Lack of mineral fuel in Portugal led to large hydroelectric development program beginning in 1946, 911.
DAMS, EARTH
See also SEEPAGE
"Design and Performance of Vermilion Dam," Karl Terzaghi and Thomas M. Leps, 63. *Discussion:* Maurice L. Dickinson; John R. Kiely; Ralph W. Spencer; Phillip J. West; Joseph H. Berman; Bruce R. Laverty; and Karl Terzaghi and Thomas M. Leps, 86.
DAMS, ROCK-FILL
"Ambuklao Rock-Fill Dam, Design and Construction," E. Montford Fucik and Robert F. Edbrooke, 1207. *Discussion:* Frederic L. Lawton; Jose O. Lahoz; and E. Montford Fucik and Robert F. Edbrooke, 1222.

DEFLECTIONS
See DEFORMATION (cross reference thereunder); MOMENTS; STRESS AND STRAIN . . .; STRUCTURES, THEORY OF; *also* under relative structure or structural part, e.g., BEAMS, CONTINUOUS; COLUMNS; DAMS, ARCH
DEFORMATION
See STRESS AND STRAIN; *see also* under type of material, e.g., CLAY
DESIGN
See under relative subject, e.g., BRIDGES; CONCRETE . . .; DAMS . . .; DOCKS AND WHARVES; GIRDERS; HIGHWAYS AND ROADS; PIPE LINES; RESERVOIRS; STRUCTURES, TIMBER
DESIGN ANALYSIS
See under relative subject, e.g., STRUCTURES, THEORY OF
DESIGN CURVES
See CURVES (design curves) (cross reference thereunder)
DIGITAL COMPUTERS
See ELECTRONIC INSTRUMENTS
DIKES
See also LEVEES
"The Columbia River Controlled," Louis H. Foote (with discussion), 583.
DISTILLATION
See also EVAPORATION
"Meteoric Versus Nonmeteoric Ground Water," Harold E. Thomas and Donald E. White, 1304.
DOCKS AND WHARVES
See also STRESS AND STRAIN—Docks and Wharves
"Cellular Cofferdams and Docks," Edward M. Cummings (with discussion), 13.
"Forces Induced on a Large Vessel by Surge," John T. O'Brien and David I. Kuchenreuther (with discussion), 855.
DRAINAGE
See also RUNOFF
"Hydrology of Urban Runoff," A. L. Tholin and Clint J. Keifer (with discussion), 1308.
DROP-DOWN
See SPILLWAYS; WATER, FLOW OF, IN OPEN CHANNELS
DURATION CURVES
See also HYDROGRAPHS
"Ambuklao Rock-Fill Dam, Design and Construction," E. Montford Fucik and Robert F. Edbrooke (with discussion), 1207.
"Hydraulic Problem Solution on Electronic Computers," Edward A. Lawler and Frank V. Druml, 517.
EARTH . . .
See also SOIL . . .
EARTH DAMS
See DAMS, EARTH
EARTH PRESSURE
"Compacted Clay": A Symposium, T. William Lambe (with discussion), 681.
"Garrison Dam Test Tunnel": A Symposium, Harris H. Burke, and Kenneth S. Lane (with discussion), 228.
EARTHQUAKE RECORDING INSTRUMENTS
"Earthquake Response of Elevated Tanks and Vessels," Donald F. Moran and James A. Cheney (with discussion), 503.
EARTHQUAKES
See also SEISMOLOGY; STRUCTURES, THEORY OF—Earthquake Problems; VIBRATION
"Earthquake Response of Elevated Tanks and Vessels," Donald F. Moran and James A. Cheney, 503. *Discussion:* A. A. Eremin; and Donald F. Moran and James A. Cheney, 515.
EARTHWORK
See SOILS . . .
ECONOMICS
See COSTS . . .
EDUCATION
"Progress in ASCE,": Annual Address at the Convention, Reno, Nevada, June 22, 1960, Frank A. Marston, 1380.
ELASTIC CURVES
See CURVES (elastic curves) (cross reference thereunder)
ELASTICITY
See also PLASTICITY; STRESS AND STRAIN
"Elasti-Plastic Analysis of Continuous Frames and Beams," Lawrence P. Johnson, Jr., and Herbert A. Sawyer, Jr., (with discussion), 1176.
"Inelastic Buckling in Steel," Geerhard Haaijer and Bruno Thurlimann (with discussion), 308.
"Numerical Solutions for Beams on Elastic Foundations," Henry Malter (with discussion), 757.
ELASTO PLASTIC STRUCTURES
"Elasti-Plastic Analysis of Continuous Frames and Beams," Lawrence P. Johnson, Jr., and Herbert A. Sawyer, Jr., 1176. *Discussion:* Giuliano Augusti; Tullio Renzulli; Emilio Rosenblueth; A. A. Eremin; and Lawrence P. Johnson, Jr., and Herbert A. Sawyer, Jr., 1192.
ELECTRONIC COMPUTERS
See COMPUTATION AND COMPUTERS; ELECTRONIC INSTRUMENTS; *also* under relative subject
ELECTRONIC INSTRUMENTS
See also COMPUTATION AND COMPUTERS

ELECTRONIC INSTRUMENTS (continued)
"Digital Computation for Stiffness Matrix Analysis," John S. Archer, 1.
"Hydraulic Problem Solution on Electronic Computers," Edward A. Lawler and Frank V. Druml, 517.
ENERGY
See STRUCTURES, THEORY OF
ENGINEERING HISTORY
See AMERICAN SOCIETY OF CIVIL ENGINEERS
ENGINEERS AND ENGINEERING (General)
See ENGINEERS AND ENGINEERING—History; *also* under relative subject, e.g., DAMS . . . ; PIPE LINES
See also AMERICAN SOCIETY OF CIVIL ENGINEERS (For memoirs of deceased members, *see* name of member in Author Index) *(See also* p. 1393); EDUCATION; RESEARCH; SOCIETIES, TECHNICAL
"Progress in ASCE," Annual Address at the Convention, Reno, Nevada, June 22, 1960, Frank A. Marston, 1380.
History
"Arch Dams": A Symposium, Manuel Rocha, J. Laginha Serafim, and Antonio F. da Silveira; Carlo Semenza; and Dino Tonini (with discussion), 909.
"Freeways in Urban Planning," Harold M. Lewis (with discussion), 1072.
ENGINEERING SOCIETIES
See AMERICAN SOCIETY OF CIVIL ENGINEERS; SOCIETIES, TECHNICAL
EROSION, BEACH
"Delta Project" A Symposium, Johannes B. Schijf; J. J. Dronkers; and H. A. Ferguson (with discussion), 1267.
EROSION, STREAM
"Delta Project" A Symposium, Johannes B. Schijf; J. J. Dronkers; and H. A. Ferguson (with discussion), 1267.
ESTUARIES
See RIVERS
EVAPORATION
See also DISTILLATION
"Meteoric Versus Nonmeteoric Ground Water," Harold E. Thomas and Donald E. White, 1304.
EXCAVATION (General)
See also EARTH PRESSURE; *also* under specific substructure, e.g., TUNNELS
"Garrison Dam Test Tunnel": A Symposium, Harris H. Burke, and Kenneth S. Lane (with discussion), 228.
EXPERIMENTS AND EXPERIMENTATION
See under material structure or structural part tested, e.g., GIRDERS
EXPLORATION
See FOUNDATIONS . . .
EXPLOSION, ATOMIC
See ATOMIC BLAST
EXPRESSWAYS
See HIGHWAYS AND ROADS; TRAFFIC, HIGHWAY AND ROAD
FAILURES (General)
See BEARING CAPACITY (cross reference thereunder); STRENGTH OF MATERIALS; STRESS AND STRAIN *also* under relative subject, e.g., HIGHWAYS; PIPE LINES
FAILURES, CONCRETE
"Strength of Reinforced Concrete Beams," Sidney A. Guralnick, (with discussion), 603.
FAILURES, RESERVOIR
"Distribution of Sediment in Large Reservoirs," Whitney M. Borland and Carl R. Miller, 166.
FLANGES
See also STRESS AND STRAIN—Flanges
"Inelastic Buckling in Steel," Geerhard Haaijer and Bruno Thurlimann (with discussion), 308.
FLEXURE
See STRESS AND STRAIN; STRUCTURES, THEORY OF
FLOOD ROUTING
See also WATER DIVERSION
"Hydrology of Urban Runoff," A.L. Tholin and Clint J. Deifer (with discussion), 1308.
FLOODS (General)
See also HYDROGRAPHS, STREAM FLOW; LEVEES
"The Columbia River Controlled," Louis H. Foote (with discussion), 583.
FLOORS AND FLOORING
See STRESS AND STRAIN—Floors and Flooring
FLOW
See GROUND WATER; LIQUIDS, FLOW OF . . . ; (cross reference thereunder); SEEPAGE; SEWAGE . . . ; SEWERS
FLOW OF FLUIDS
See GAS . . . ; LIQUIDS, FLOW OF (cross reference thereunder); PIPES AND PIPING
FLOW OF WATER
See WATER, FLOW OF . . .
FORMULAS
See under relative subject, e.g., BEAMS; LOAD
FOUNDATIONS (General)
See also SEEPAGE; STRESS AND STRAIN—Foundations; STRUCTURES, THEORY OF—Foundations
"Numerical Solutions for Beams on Elastic Foundations," Henry Malter (with discussion), 757.
FOUNDATIONS, DAM
"Ambuklao Rock-Fill Dam, Design and Construction," E. Montford Fucik and Robert F. Edbrooke (with discussion), 1207.
"Arch Dams": A Symposium, Manuel Rocha, J. Laginha Serafim, and

FOUNDATIONS, DAM (continued)
Antonio F. da Silveira; Carlo Semenza; and Dino Tonini (with discussion), 909.
"Design and Performance of Vermilion Dam," Karl Terzaghi and Thomas M. Leps (with discussion), 63.
FOUNDATIONS, UNDERWATER
See also PILES AND PILE DRIVING (cross reference thereunder)
"Water Forces on Accelerated Cylinders," Alan D. K. Laird, Charles A. Johnson, and Robert W. Walker, 652.
FRAMES (General)
See BEAMS . . .
FREEWAYS
See HIGHWAYS AND ROADS (General)—Location
FRICTION
See also TURBULENCE (cross reference thereunder)
"Cellular Cofferdams and Docks," Edward M. Cummings (with discussion), 13.
"Compacted Clay": A Symposium, T. William Lambe (with discussion), 681.
"Resistance Properties of Sediment-Laden Streams," Vito A. Vanoni and George N. Nomicos (with discussion), 1140.
FRICTION COEFFICIENTS, FLUID
"Resistance Properties of Sediment-Laden Streams," Vito A. Vanoni and George N. Nomicos (with discussion), 1140.
GAGES, LIQUID
"Flow Testing by Ammonia Displacement," Jack N. White and Thomas Thawley, 673.
GAGES, PRESSURE
"Design and Performance of Vermilion Dam," Karl Terzaghi and Thomas M. Leps (with discussion), 63.
"Water Forces on Accelerated Cylinders," Alan D. K. Laird, Charles A. Johnson, and Robert W. Walker, 652.
GAGES, RAIN
"Hydrology of Urban Runoff," A. L. Tholin and Clint J. Keifer (with discussion), 1308.
GAGES, STREAM
See also WATER LEVEL RECORDING AND INDICATING INSTRUMENTS
"Sleuthing the Behavior of a River," Edward F. Cleary (with discussion), 1053.
GAS AND GASWORKS
See also PIPE LINES; TUNNELS, GAS
"Flow Testing by Ammonia Displacement," Jack N. White and Thomas Thawley, 673.
GATE VALVES
"Hydraulic Design of Columbia River Navigation Locks," George C. Richardson and Marvin J. Webster, 345.
GEOCHEMISTRY
See CHEMISTRY (cross reference thereunder)
GEOLOGY
"Design and Performance of Vermilion Dam," Karl Terzaghi and Thomas M. Leps (with discussion), 63.
GIRDER BRIDGES
See BRIDGES, GIRDER
GIRDERS (General)
See also BEAMS; BRIDGES; STRESS AND STRAIN—Girders; STRUCTURES, THEORY OF—Beams and Girders
"Analytical and Experimental Study of Helicoidal Girders," Yee F. Young and Alexander C. Scordelis, 46.
"Numerical Solutions for Interconnected Bridge Girders," Henry Malter, 365.
Discussion: Dronnadula V. Reddy; Henry Malter; 383.
GIRDERS, CONTINUOUS
See BRIDGES, GIRDER; STRUCTURES, THEORY OF—Beams and Girders
GRAPHICAL CHARTS
"Selection of Design Wave for Offshore Structures," Charles L. Bretschneider (with discussion), 388.
GRAVEL
See also SAND; SOILS
"Geotechnical Properties of Glacial Lake Clays," Tien H. Wu (with discussion), 994
GROINS
See also RIVER BANKS AND BANK PROTECTION (cross references thereunder); SHORES AND SHORE PROTECTION
"Delta Project" A Symposium, Johannes B. Schijf; J. J. Dronkers; and H. A. Ferguson (with discussion), 1267.
GROUND WATER
See also SEEPAGE; WATER SUPPLY
"Meteoric Versus Nonmeteoric Ground Water," Harold E. Thomas and Donald E. White, 1304.
"Underseepage Control at Fort Randall Dam," Stanley T. Thorfinnson, 792.
"Use of Models to Study Ground-Water Problems," Kenneth B. Wright, 133.
HARBORS (General)
See also SHORES AND SHORE PROTECTION
"Stability of Coastal Inlets," Per Brun and Frans Gerritsen (with discussion), 1228.
HEAD GATES
See INTAKES
HIGHWAYS AND ROADS (General)
See PAVEMENT AND PAVING
Location
"Freeways in Urban Planning," Harold M. Lewis (with discussion), 1072.

HIGHWAY TRANSPORTATION
See also HIGHWAYS AND ROADS—Location
"Freeways in Urban Planning," Harold M. Lewis (with discussion), 1072.
HURRICANES
See WIND . . .
HYDRAULIC LABORATORIES
"Sleuthing the Behavior of a River," Edward J. Cleary (with discussion), 1053.
HYDRAULIC MODELS
See MODELS; HYDRAULIC
HYDRAULICS
See also FLOW . . . (cross reference thereunder); GROUND WATER; HEAD GATES (cross reference thereunder); LOCK GATES; LOCKS; SEEPAGE: MODELS, HYDRAULIC; SPREADING WATER; STRUCTURES, THEORY OF
"Hydraulic Design of Columbia River Navigation Locks," George C. Richardson and Marvin J. Webster, 345.
HYDROGRAPHS (General)
See also DURATION CURVES
"Ambuklao Rock-Fill Dam, Design and Construction," E. Montford Fucik and Robert F. Edbrooke (with discussion), 1207.
"Hydraulic Problem Solution on Electronic Computers," Edward A. Lawler and Frank V. Druml, 517.
HYDROGRAPHS, RAINFALL
"Hydrology of Urban Runoff," A. L. Tholin and Clint J. Keifer (with discussion), 1308.
HYDROGRAPHS, RUNOFF
"Hydrology of Urban Runoff," A. L. Tholin and Clint J. Keifer (with discussion), 1308.
HYDROGRAPHS, STREAM FLOW
"Hydraulic Problem Solution on Electronic Computers," Edward A. Lawler and Frank V. Druml, 517.
"Sleuthing the Behavior of a River," Edward J. Cleary (with discussion), 1053.
HYDROLOGY
See also DRAINAGE; EVAPORATION; GROUND WATER; RUNOFF; WATER . . .
"Hydrology of Urban Runoff," A. L. Tholin and Clint J. Keifer (with discussion), 1308.
"Meteoric Versus Nonmeteoric Ground Water," Harold E. Thomas and Donald E. White, 1304.
IMPACT
See also IMPULSE; VIBRATION
"Forces Induced on a Large Vessel by Surge," John T. O'Brien and David I. Kuchenreuther (with discussion), 855.
IMPULSE
See also IMPACT; STRUCTURAL DYNAMICS
"Blast Phenomena From a Nuclear Burst," Ferd E. Anderson, Jr., 667.
INFLUENCE LINES
See MOMENTS
INTAKES
"Hydraulic Design of Columbia River Navigation Locks," George C. Richardson and Marvin J. Webster, 345.
IRRIGATION
"The Columbia River Controlled," Louis H. Foote (with discussion), 583.
IRRIGATION CANALS
See COSTS, CANAL (IRRIGATION CANALS)
JOINTS, WELDED
"Pipeline Field Welding and Quality Control Methods," Armand G. Barkow, 417
"Welded Pipeline Branch Connections," Everett C. Rodabaugh and Henry H. George, 554.
LAKES (General)
See also SILT AND SILTING . . .
"Geotechnical Properties of Glacial Lake Clays," Tien H. Wu (with discussion), 994.
LEVEES
See also DIKES
"The Columbia River Controlled," Louis H. Foote (with discussion), 583.
LIBRARIES
"Progress in ASCE,": Annual Address at the Convention, Reno, Nevada, June 22, 1960, Frank A. Marston, 1380.
LIMIT DESIGN, THEORY OF
"Elasti-Plastic Analysis of Continuous Frames and Beams," Lawrence P. Johnson, Jr., and Herbert A. Sawyer, Jr. (with discussion), 1176.
LININGS
See under relative type, e.g., CANAL LININGS
LIQUIDS, FLOW OF . . .
See VISCOSITY
LOAD
See BEARING CAPACITY (cross reference thereunder); BUCKLING; EARTH PRESSURE; STRESS AND STRAIN (cross reference thereunder) *also* under structure, structural member or part, e.g., BEAMS . . .; TUNNELS
LOCK-GATES
See also STRUCTURES, THEORY OF—Lock-Gates
"Hydraulic Design of Columbia River Navigation Locks," George C. Richardson and Marvin J. Webster, 345.
LOCKS
See also HEAD GATES (cross reference thereunder)

LOCKS (continued)
Highest lift navigation locks on the Columbia River Basin Projects. 345.
"Hydraulic Design of Columbia River Navigation Locks," George C. Richardson and Marvin J. Webster, 345.
MATERIALS OF CONSTRUCTION
See also CLAY; CONCRETE . . .; EARTHQUAKES; PERMEABILITY OF MATERIALS (cross reference thereunder); SAND; SEEPAGE; SILT; SOILS; STEEL; STRENGTH OF MATERIALS; STRUCTURES, THEORY OF; TIMBER AND TIMBERING
"Ambuklao Rock-Fill Dam, Design and Construction," E. Montford Fucik and Robert F. Edbrooke (with discussion), 1207.
"Concrete Beams and Columns with Bundled Reinforcement," Norman W. Hanson and Hans Reiffenstuhl (with discussion), 889.
"Construction of the Variable-Angle Launcher," Arthur C. Bravo, 181.
"Factor of Safety in Design of Timber Structures," Lyman W. Wood (with discussion), 1033.
"Garrison Dam Test Tunnel": A Symposium, Harris H. Burke, and Kenneth S. Lane (with discussion), 228.
"Geotechnical Properties of Glacial Lake Clays," Tien H. Wu (with discussion), 994.
"Structural Dynamics in Earthquake-Resistant Design," John A. Blume (with discussion), 1088.
MATRIX ALGEBRA
See COMPUTATION AND COMPUTERS
MEASURING INSTRUMENTS
See GAGES . . .
MEMBERS (ASCE)
See AMERICAN SOCIETY OF CIVIL ENGINEERS. (For memoirs of deceased members, *see* name of member in Author Index) (*See also* p. 1393)
MEMOIRS OF DECEASED MEMBERS
See name of member in Author Index. (*See also* p. 1393)
METEOROLOGY
See also EVAPORATION; RAINFALL
"Meteoric Versus Nonmeteoric Ground Water," Harold E. Thomas and Donald E. White, 1304.
MODEL ANALYSIS INSTRUMENTS
"Analytical and Experimental Study of Helicoidal Girders," Yee F. Young and Alexander C. Scordelis, 46.
MODELS (General)
"Cellular Cofferdams and Docks," Edward M. Cummings (with discussion), 13.
"Use of Models to Study Ground-Water Problems," Kenneth R. Wright, 133.
MODELS, ELECTRIC
"Use of Models to Study Ground-Water Problems," Kenneth R. Wright, 133.
MODELS, HYDRAULIC
"Arch Dams": A Symposium, Manuel Rocha, J. Laginha Serafim, and Antonio F. da Silveira; Carlo Semenza; and Dino Tonini (with discussion), 909.
"Hydraulic Design of Columbia River Navigation," George C. Richardson and Marvin J. Webster, 345.
"Use of Models to Study Ground-Water Problems," Kenneth R. Wright, 133.
MODELS, STRUCTURAL
"Analytical and Experimental Study of Helicoidal Girders," Yee F. Young and Alexander C. Scordelis, 46.
"Arch Dams": A Symposium, Manuel Rocha, J. Laginha Serafim and Antonio F. da Silveira; Carlo Semenza; and Dino Tonini (with discussion), 909.
MOMENT DISTRIBUTION
See STRUCTURES, THEORY OF
MOMENTS
See also STRESS AND STRAIN; STRUCTURES, THEORY OF; *also* under specific type of stress, e.g., LOAD; SHEAR
"Analytical and Experimental Study of Helicoidal Girders," Yee F. Young and Alexander C. Scordelis, 46.
"Elasti-Plastic Analysis of Continuous Frames and Beams," Lawrence P. Johnson, Jr., and Herbert A. Sawyer, Jr. (with discussion), 1176.
"Numerical Solutions for Beams on Elastic Foundations," Henry Malter (with discussion), 757.
OBITUARIES OF MEMBERS
See name of member in Author Index. (*See also* p. 1393)
OCEAN CURRENTS
See also EROSION, BEACH; TIDES; WAVES
"Delta Project": A Symposium, Johannes B. Schijf; J. J. Dronkers; and H. A. Ferguson (with discussion), 1267.
"Forces Induced on a Large Vessel by Surge," John T. O'Brien and David I. Kuchenreuther (with discussion), 855.
"Water Forces on Accelerated Cylinder," Alan D. K. Laird, Charles A. Johnson, and Robert W. Walker, 652.
OIL, FLOW OF
See PIPE LINES
OIL STORAGE
See TANKS, OIL STORAGE
OXYGENATION
See also AERATION
"Self-Aerated Flow in Open Channels," Lorenz G. Straub and Alvin G. Anderson (with discussion), 456.

PAVEMENT AND PAVING (General)
"Clay Strength and Increase Caused by Repeated Loading," H. Bolton Seed, Robert L. McNeill, and Jacques de Guenin (with discussion), 141.
PENSTOCKS
"Trends in Pipeline Construction," James W. Hall, 123.
PERMEABILITY OF MATERIALS
See SEEPAGE; *also* under type of material, e.g., CLAY
PIERS (waterway structures)
See DOCKS AND WHARVES
PIEZOMETERS
See GAGES, PRESSURE
PILES AND PILE DRIVING
See FOUNDATIONS, UNDERWATER
PIPE LINES
See also COSTS, PIPE LINES; PENSTOCKS; PIPES AND PIPING (fluid conveyance); STRESS AND STRAIN—Pipe Lines
"Electric Pipeline for High-Viscosity Fuel," Albert G. Purdue, 644.
First high pressure, long distance line built in 1891 from Greentown, Ind., to Chicago, Ill. p. 418
"Flow Testing by Ammonia Displacement," Jack N. White and Thomas Thawley, 673.
One-hundreth anniversary of oil and gas industry in America coincides closely with the birth of oil and gas pipelining. p. 123.
"Pipeline Field Welding and Quality Control Methods," Armand G. Barkow, 417.
"Trends in Pipeline Construction," James W. Hall, 123.
"Welded Pipeline Branch Connections," Everett C. Rodabaugh and Henry H. George, 554.
PIPES AND PIPING (fluid conveyance)
See also PIPE LINES
"Electric Pipeline for High-Viscosity Fuel," Albert G. Purdue, 644.
"Flow Testing by Ammonia Displacement," Jack N. White and Thomas Thawley, 673.
"Trends in Pipeline Construction," James W. Hall, 123.
PIPES AND PIPING, COSTS
"Trends in Pipeline Construction," James W. Hall, 123.
PLASTICITY
See also ELASTICITY; STRESS AND STRAIN
"Elasti-Plastic Analysis of Continuous Frames and Beams," Lawrence P. Johnson, Jr., and Herbert A. Sawyer, Jr. (with discussion), 1176.
"Inelastic Buckling in Steel," Geerhard Haaijer and Bruno Thurlimann (with discussion), 308.
PLATES
"Digital Computation for Stiffness Matrix Analysis," John S. Archer, 1.
POWER (General)
See also DAMS; WATER POWER
"Ambuklao Rock-Fill Dam, Design and Construction," E. Montford Fucik and Robert F. Edbrooke (with discussion), 1207.
"The Columbia River Controlled," Louis H. Foote (with discussion), 583.
"Water-A Limiting Resource," Robert O. Thomas (with discussion), 101.
POWER PLANTS (General)
See also STRUCTURES, THEORY OF—Power Plants
"Containment Sphere for Dresden Station," Leonard P. Zick, James T. Dunn, and James B. Maher, 536.
PRESIDENTIAL ADDRESSES (American Society of Civil Engineers)
See AMERICAN SOCIETY OF CIVIL ENGINEERS—Addresses; *see also* under subject of address
PRESSURE
See IMPACT; STRESS AND STRAIN
PUBLIC WORKS
"Water-A Limiting Resource," Robert O. Thomas (with discussion), 101.
RAINFALL (General)
See also DRAINAGE; EVAPORATION; GAGES, RAIN; HYDROGRAPHS, RAINFALL; HYDROLOGY; RUNOFF; SEEPAGE
"Meteoric Versus Nonmeteoric Ground Water," Harold E. Thomas and Donald E. White, 1304.
RECREATIONAL FACILITIES
See RESERVOIRS; RIVERS
REDUNDANCE, STRUCTURAL
See STRUCTURES, THEORY OF
REGIONAL PLANNING
See also CITY PLANNING; HIGHWAYS AND ROADS—Location: ZONING
"Freeways in Urban Planning," Harold M. Lewis (with discussion), 1072.
REINFORCED CONCRETE
See CONCRETE
RESEARCH
See also AMERICAN SOCIETY OF CIVIL ENGINEERS; MODELS . . .; TESTS AND TESTING (cross references thereunder)
"Progress in ASCE,": Annual Address at the Convention, Reno, Nevada, June 22, 1960, Frank A. Marston, 1380.
RESERVOIRS (General)
See also COSTS, RESERVOIR; DAMS; FAILURES, RESERVOIRS; SEDIMENTATION; SILT AND SILTING; RESERVOIR; WATER STORAGE
"Ambuklao Rock-Fill Dam, Design and Construction," E. Montford Fucik and

RESERVOIRS (General) (continued)
Robert F. Edbrooke (with discussion), 1207.
"The Columbia River Controlled," Louis H. Foote (with discussion), 583.
"Distribution of Sediment in Large Reservoirs," Whitney M. Borland and Carl R. Miller, 166.
RESERVOIRS, MULTI-PURPOSE
See COSTS, RESERVOIR (MULTI-PURPOSE RESERVOIRS)
RESERVOIRS, STREAM REGULATION
See RESERVOIRS, WATER STORAGE
RESERVOIRS, WATER STORAGE
"Distribution of Sediment in Large Reservoirs," Whitney M. Borland and Carl R. Miller, 166.
RESONANCE
See VIBRATION; WAVES
RETAINING WALLS
See also SEA WALLS
"Delta Project" A Symposium, Johannes B. Schijf; J. J. Dronkers; and H. A. Ferguson (with discussion), 1267.
RIVER BANKS AND BANK PROTECTION
See EROSION, STREAM; SEDIMENT AND SEDIMENTATION; SILT AND SILTING, CHANNEL
RIVER BASINS
See RESERVOIRS...
RIVER DELTAS
"Delta Project" A Symposium, Johannes B. Schijf; J. J. Dronkers; and H. A. Ferguson, 1267. *Discussion:* Richard Silvester, Johannes B. Schijf, 1278.
"Stability of Coastal Inlets," Per Brun and Frans Gerritsen (with discussion), 1228.
RIVER REGULATIONS
See RIVERS
RIVERS (General)
See also CHANNELS; FLOODS; GAGES, STREAM; HYDRAULIC LABORATORIES; HYDROGRAPHS, STREAM FLOW; LEVEES; RESERVOIRS...; SEDIMENT AND SEDIMENTATION; SILT AND SILTING, CHANNELS; TIDES; TRAFFIC, RIVER; TRAFFIC, WATERWAY; WATER...; WATERWAYS...; WAVES
"The Columbia River Controlled," Louis H. Foote, 583. *Discussion:* Roy F. Bessey; Louis H. Foote, 597.
"Resistance Properties of Sediment-Laden Streams," Vito A. Vanoni and George N. Nomicos (with discussion), 1140.
"Sleuthing the Behavior of a River," Edward J. Cleary (with discussion), 1053.
"Stability of Coastal Inlets," Per Brun and Frans Gerritsen (with discussion), 1228.
RUNOFF (General)
See also HYDROGRAPHS, RUNOFF
"Hydrology of Urban Runoff," A. L. Tholin and Clint J. Keifer (with discussion), 1308. *Discussion:* Peter O. Wolf; M. B. McPherson and M. Joseph Willis; Paul Bock; Carl F. Izzard and Charles L. Armentrout, 1355.
"Water-A Limiting Resource," Robert O. Thomas (with discussion), 101.
SAFETY (General)
"Factor of Safety in Design of Timber Structures," Lyman W. Wood (with discussion), 1033.
SAND
See also GRAVEL; SEDIMENT AND SEDIMENTATION; SILT AND SILTING...; SOILS
"Resistance Properties of Sediment-Laden Streams," Vito A. Vanoni and George N. Nomicos (with discussion), 1140.
SAND DUNES
See also BED LOAD (cross references thereunder)
"Delta Project" A Symposium, Johannes B. Schijf; J. J. Dronkers; and H. A. Ferguson (with discussion), 1267.
SANITATION
See also WATER...
"Sleuthing the Behavior of a River," Edward J. Cleary (with discussion), 1053.
SEA WALLS
See also RETAINING WALLS; SHORES AND SHORE PROTECTION; WAVES
"Delta Project" A Symposium, Johannes B. Schijf; J. J. Dronkers; and H. A. Ferguson (with discussion), 1267.
SEDIMENT AND SEDIMENTATION
See also COSTS, SEDIMENT DISPOSAL; SILT AND SILTING
"Delta Project" A Symposium, Johannes B. Schijf; J. J. Dronkers; and H. A. Ferguson (with discussion), 1267.
"Distribution of Sediment in Large Reservoirs," Whitney M. Borland and Carl R. Miller, 166.
"Geotechnical Properties of Glacial Lake Clays," Tien H. Wu (with discussion), 994.
"Resistance Properties of Sediment-Laden Streams," Vito A. Vanoni and George N. Nomicos, 1140. *Discussion:* Emmett M. Laursen; Tsung-Lienchow; and Vito A. Vanoni and George N. Nomicos, 1167.
"Stability of Coastal Inlets," Per Brun and Frans Gerritsen (with discussion), 1228.
SEEPAGE
See also GROUND WATER

SEEPAGE (continued)
"Design and Performance of Vermilion Dam," Karl Terzaghi and Thomas M. Leps (with discussion), 63.
"Lower-Cost Canal Lining Practice," Richard J. Willson (with discussion), 487.
"Meteoric Versus Nonmeteoric Ground Water," Harold E. Thomas and Donald E. White, 1304.
"Underseepage Control at Fort Randall Dam," Stanley T. Thorfinnson, 792.
"Use of Models to Study Ground-Water Problems," Kenneth R. Wright, 133.
SEISMOLOGY
See also EARTHQUAKES
"Earthquake Response of Elevated Tanks and Vessels," Donald F. Moran and James A. Cheney, 503.
"Structural Dynamics in Earthquake-Resistant Design," John A. Blume (with discussion), 1088.
SETTLEMENT OF FILL
See SOILS—Construction
SETTLING BASINS (water supply)
See also TANKS, SEDIMENTATION (sewage)
"Hydrology of Urban Runoff," A. L. Tholin and Clint J. Keifer (with discussion), 1308.
SEWAGE DISPOSAL (General)
See also TANKS . . .
"Hydrology of Urban Runoff," A. L. Tholin and Clint J. Keifer (with discussion), 1308.
SEWERS (General)
See DRAINAGE; RAINFALL; RUNOFF
SHEAR
"Amplified Stress and Displacement in Guyed Towers," Robert S. Rowe (with discussion), 199.
"Arch Dams": A Symposium, Manuel Rocha, J. Laginha Serafim, and Antonio F. da Silviera; Carlo Semenza; and Dino Tonini (with discussion), 909.
"Cellular Cofferdams and Docks," Edward M. Cummings (with discussion), 13.
"Clay Strength Increase Caused by Repeated Loading," H. Bolton Seed, Robert L. McNeill, and Jacques de Guenin (with discussion), 141.
"Compacted Clay": A Symposium, T. William Lambe (with discussion), 681.
"Concrete Beams and Columns with Bundled Reinforcement," Norman W. Hanson and Hans Reiffenstuhl (with discussion), 889.
"Moments in Beams by the Method of Partial Moments," Harry Posner (with discussion), 430.
"Numerical Solutions for Beams on Elastic Foundations," Henry Malter (with discussion), 757.
"Strength of Reinforced Concrete Beams," Sidney A. Guralnick (with discussion), 603.
SHELL STRUCTURES
See also STRESS AND STRAIN—Shell Structures; STRUCTURES, THEORY OF—Shell Structures
"Containment Sphere for Dresden Station," Leonard P. Zick, James T. Dunn, and James B. Maher, 536.
SHIP . . .
"Forces Induced on a Large Vessel by Surge," John T. O'Brien and David Kuchenreuther (with discussion), 855.
SHIP MOORINGS AND MOORAGES
See DOCKS AND WHARVES
SHOCK
See ATOMIC BLAST; EARTHQUAKES; IMPACT; VIBRATION
SHORES AND SHORE PROTECTION (lands adjacent to lake, ocean, or sea water)
See also EROSION, BEACH; RETAINING WALLS; RIVER BANKS AND BANK PROTECTION (cross reference thereunder); SAND DUNES; WAVES
"Delta Project": A Symposium, Johannes B. Schijf; J. J. Dronkers; and H. A. Ferguson (with discussion), 1267.
"Selection of Design Wave for Offshore Structures," Charles L. Bretschneider (with discussion), 388.
"Stability of Coastal Inlets," Per Brun and Frans Gerritsen, 1228. *Discussion:* Robert E. Hickson, 1259.
SILT AND SILTING (General)
See also SEDIMENT AND SEDIMENTATION
"Design and Performance of Vermilion Dam," Karl Terzaghi and Thomas M. Leps (with discussion), 63.
"Distribution of Sediment in Large Reservoirs," Whitney M. Borland and Carl R. Miller, 166.
"Geotechnical Properties of Glacial Lake Clays," Tien H. Wu (with discussion), 994.
"Resistance Properties of Sediment-Laden Streams," Vito A. Vanoni and George N. Nomicos (with discussion), 1140.
SILT AND SILTING, CHANNELS
See also RIVER DELTAS
"Delta Projects" A Symposium, Johannes B. Schijf; J. J. Dronkers; and H. A. Ferguson (with discussion), 1267.
"Resistance Properties of Sediment-Laden Streams," Vito A. Vanoni and George N. Nomicos (with discussion), 1140.

SILT AND SILTING, CHANNELS (continued)
"Stability of Coastal Inlets," Per Brun and Frans Gerritsen (with discussion), 1228.
SILT AND SILTING, RESERVOIR
"Distribution of Sediment in Large Reservoirs, Whitney M. Borland and Carl R. Miller, 166.
SOCIETIES, TECHNICAL
See also AMERICAN SOCIETY OF CIVIL ENGINEERS; ENGINEERS AND ENGINEERING; *also* under relative subject
"Progress in ASCE," Annual Address at the Convention, Reno, Nevada, June 22, 1960, Frank A. Marston, 1380.
SOIL . . .
See also EARTH . . .
SOIL MECHANICS
See SOIL . . .
SOILS (General)
See also BEARING CAPACITY (cross reference thereunder); CLAY; EARTH PRESSURE; FRICTION . . .; GRAVEL; HIGHWAYS; PAVEMENT AND PAVING; SAND; SEDIMENT AND SEDIMENTATION; SILT AND SILTING . . .; STRESS AND STRAIN
"Compacted Clay"; A Symposium, T. William Lambe (with discussion), 681.
"Stability of Coastal Inlets," Per Brun and Frans Gerritsen (with discussion), 1228.
Compaction
See BEARING CAPACITY (cross reference thereunder)
Construction
"Design and Performance of Vermilion Dam," Karl Terzaghi and Thomas M. Leps (with discussion), 63.
"Ambuklao Rock-Fill Dam, Design and Construction," E. Montford Fucik and Robert F. Edbrooke (with discussion), 1207.
Tests and Testing
"Clay Strength Increase Caused by Repeated Loading," H. Bolton Seed, Robert L. McNeill, and Jacques de Guenin (with discussion), 141.
"Compacted Clay": A Symposium, T. William Lambe (with discussion), 681.
"Delta Project" A Symposium, Johannes B. Schijf; J. J. Dronkers; and H. A. Ferguson (with discussion), 1267.
SPILLWAYS (General)
See also DAMS; DROP-DOWN (cross references thereunder)
"Ambuklao Rock-Fill Dam, Design and Construction," E. Montford Fucik and Robert F. Edbrooke (with discussion), 1207.
SPREADING, WATER
"Use of Models to Study Ground-Water Problems," Kenneth R. Wright, 133.
STEAM POWER
See POWER
STEEL (General)
See also BRIDGES; MATERIALS OF CONSTRUCTION; REINFORCED CONCRETE (cross reference thereunder); STRENGTH OF MATERIALS; STRESS AND STRAIN—Steel; *also* under special structure or structural part, e.g., COLUMNS; FLANGES; PLATES; TOWERS
"Amplified Stress and Displacement in Guyed Towers," Robert S. Rowe (with discussion), 199.
"Construction of the Variable-Angle Launcher," Arthur C. Bravo, 181.
"Concrete Beams and Columns with Bundled Reinforcement," Norman W. Hanson and Hans Reiffenstuhl (with discussion), 889.
"Garrison Dam Test Tunnel"; A Symposium, Harris H. Burke, and Kenneth S. Lane (with discussion), 228.
"Inelastic Buckling in Steel," Geerhard Haaijer and Bruno Thurlimann (with discussion), 308.
Tests and Testing
"Inelastic Buckling in Steel," Geerhard Haaijer and Bruno Thurlimann (with discussion), 308.
STIFFNESS
"Analytical and Experimental Study of Helicoidal Girders," Yee F. Young and Alexander C. Scordelis, 46.
"Clay Strength Increase Caused by Repeated Loading," H. Bolton Seed, Robert L. McNeill, and Jacques de Guenin (with discussion), 141.
STORAGE
See OIL STORAGE (cross reference thereunder)
STREAM FLOW
See WATER, FLOW OF, IN OPEN CHANNELS and cross references thereunder
STREAMS
See RIVERS and cross references thereunder
STRENGTH OF MATERIALS
See also FAILURES . . .; STRESS AND STRAIN; *also* under specific material (*See* list of materials under MATERIALS OF CONSTRUCTION)
"Amplified Stress and Displacement in Guyed Towers," Robert S. Rowe (with discussion), 199.
"Compacted Clay": A Symposium, T. William Lambe (with discussion), 681.
"Factor of Safety in Design of Timber Structures," Lyman W. Wood (with discussion), 1033.
"Geotechnical Properties of Glacial Lake Clays," Tien H. Wu (with discussion), 994.

STRENGTH OF MATERIALS (continued)
"Strength of Reinforced Concrete Beams," Sidney A. Guralnick (with discussion), 603.
"Structural Dynamics in Earthquake-Resistant Design," John A. Blume (with discussion), 1088.
STRESS AND STRAIN (General)
See also EARTHQUAKES; ELASTICITY; FAILURES . . .; IMPACT (cross references thereunder); PLASTICITY; STRENGTH OF MATERIALS; STIFFNESS; STRUCTURES, THEORY OF; VIBRATION; WIND . . . *also* under specific type of stress, e.g., BUCKLING; SHEAR; TORSION
"Amplified Stress and Displacement in Guyed Towers," Robert S. Rowe (with discussion), 199.
"Arch Dams": A Symposium, Manuel Rocha, J. Laginha Serafim, and Antonio F. da Silveira; Carlo Semenza; and Dino Tonini (with discussion), 909.
"Garrison Dam Test Tunnel": A Symposium, Harris H. Burke, and Kenneth S. Lane (with discussion), 228.
"Moments in Beams by the Method of Partial Moments," Harry Posner (with discussion), 430.
"Strength of Reinforced Concrete Beams," Sidney A. Guralnick (with discussion), 603.
"Structural Dynamics in Earthquake-Resistant Design," John A. Blume (with discussion), 1088.
Arches
"Arch Dams": A Symposium, Manuel Rocha, J. Laginha Serafim, and Antonio F. da Silveira; Carlo Semenza; and Dino Tonini (with discussion), 909.
Beams (General)
See also BUCKLING; SHEAR; TORSION
"Concrete Beams and Columns with Bundled Reinforcement," Norman W. Hanson and Hans Reiffenstuhl (with discussion), 889.
"Lateral Bracing of Columns and Beams," George Winter (with discussion), 807.
"Moments in Beams by the Method of Partial Moments," Harry Posner (with discussion), 430.
"Numerical Solutions for Beams on Elastic Foundations," Henry Malter (with discussion), 757.
"Strength of Reinforced Concrete Beams," Sidney A. Guralnick (with discussion), 603.
Beams, Continuous
"Elasti-Plastic Analysis of Continuous Frames and Beams," Lawrence P. Johnson, Jr., and Herbert A. Sawyer, Jr. (with discussion), 1176.
"Moments in Beams by the Method of Partial Moments," Harry Posner (with discussion), 430.
"Torque-Loaded Continuous Beams of Profile Section," Donovan H. Young and John F. Brahtz, 846.
Bridge Floors and Flooring
"Design Features of the George Washington Bridge Lower Deck," Irvine P. Gould, 1022
Bridges (General)
"Design Features of the George Washington Bridge Lower Deck," Irvine P. Gould, 1022.
Bridges, Suspension
"Design Features of the George Washington Bridge Lower Deck," Irvine P. Gould, 1022.
Bridges, Truss
"Design Features of the George Washington Bridge Lower Deck," Irvine P. Gould, 1022.
Clay
See SHEAR
Columns
"Inelastic Buckling in Steel," Geerhard Haaijer and Bruno Thurlimann (with discussion), 308.
Concrete (General)
See also TORSION
"Concrete Beams and Columns with Bundled Reinforcement," Norman W. Hanson and Hans Reiffenstuhl (with discussion), 889.
"Strength of Reinforced Concrete Beams," Sidney A. Guralnick (with discussion), 603.
Dams (General)
"Ambuklao Rock-Fill Dam, Design and Construction," E. Montford Fucik and Robert F. Edbrooke (with discussion), 1207.
Dams, Arch
See also SHEAR
"Arch Dams": A Symposium, Manuel Rocha, J. Laginha Serafim, and Antonio F. da Silveira; Carlo Semenza; and Dino Tonini (with discussion), 909.
Docks and Wharves
"Forces Induced on a Large Vessel by Surge," John T. O'Brien and David Kuchenreuther (with discussion), 855.
Flanges
"Inelastic Buckling in Steel," Geerhard Haaijer and Bruno Thurlimann (with discussion), 308.
Floors and Flooring
"Lateral Bracing of Columns and Beams," George Winter (with discussion), 807.
Foundations
"Numerical Solutions for Beams on Elastic Foundation," Henry Malter (with discussion), 757.

STRESS AND STRAIN (General) (continued)
Frames, Continuous
"Elasti-Plastic Analysis of Continuous Frames and Beams," Lawrence P. Johnson, Jr., and Herbert A. Sawyer, Jr. (with discussion), 1176.
Pipe Lines
"Welded Pipeline Branch Connections," Everett C. Rodabaugh and Henry H. George, 554.
Shell Structures
"Containment Sphere for Dresden Station," Leonard P. Zick, James T. Dunn, and James B. Maher, 536.
Soils
"Clay Strength Increase Caused by Repeated Loading," H. Bolton Seed, Robert L. McNeill, and Jacques de Guenin (with discussion), 141.
Steel
"Amplified Stress and Displacement in Guyed Towers," Robert S. Rose (with discussion), 199.
"Lateral Bracing of Columns and Beams," George Winter (with discussion), 807.
Timber
"Factor of Safety in Design of Timber Structures," Lyman W. Wood (with discussion), 1033.
Towers
"Amplified Stress and Displacement in Guyed Towers," Robert S. Rowe (with discussion), 199.
Tunnel Linings
"Garrison Dam Test Tunnel": A Symposium, Harris H. Burke, and Kenneth S. Lane (with discussion), 228.
Tunnels
"Garrison Dam Test Tunnel": A Symposium, Harris H. Burke, and Kenneth S. Lane (with discussion), 228.
Wood
"Factor of Safety in Design of Timber Structures," Lyman W. Wood (with discussion), 1033.
STRUCTURAL DYNAMICS
See also EARTHQUAKES; STRUCTURES, THEORY OF; VIBRATION
"Blast Phenomena from a Nuclear Blast," Ferd E. Anderson, Jr., 667.
STRUCTURAL MODELS
See MODELS, STRUCTURAL
STRUCTURAL STEEL
See STEEL
STRUCTURES (General)
See also CONSTRUCTION; MATERIALS OF CONSTRUCTION
"Construction of the Variable-Angle Launcher," Arthur C. Bravo, 181.
STRUCTURES, THEORY OF (General)
See also STRESS AND STRAIN; *also* under type of structure or structural part
"Amplified Stress and Displacement in Guyed Towers," Robert S. Rowe (with discussion), 199.
"Analytical and Experimental Study of Helicoidal Girders," Yee F. Young and Alexander C. Scordelis, 46.
"Cellular Cofferdams and Docks," Edward M. Cummings (with discussion), 13.
"Factor of Safety in Design of Timber Structures," Lyman W. Wood (with discussion), 1033.
"Garrison Dam Test Tunnel": A Symposium, Harris H. Burke, and Kenneth S. Lane (with discussion), 228.
"Numerical Solutions for Beams on Elastic Foundations," Henry Malter (with discussion), 757.
"Strength of Reinforced Concrete Beams," Sidney A. Guralnick (with discussion), 603.
"Structural Dynamics in Earthquake-Resistant Design," John A. Blume (with discussion), 1088.
Arches
"Design and Observation in Portugal," Manuel Rocha, J. Laginha Serafim, and Antonio F. da Silveira (with discussion), 911.
Beams and Girders (General)
"Concrete Beams and Columns with Bundled Reinforcement," Norman W. Hanson and Hans Reiffenstuhl (with discussion), 889.
"Lateral Bracing of Columns and Beams," George Winter (with discussion), 807.
"Numerical Solutions for Interconnected Bridge Girders," Henry Malter (with discussion), 365.
"Moments in Beams by the Method of Partial Moments," Harry Posner (with discussion), 430.
"Strength of Reinforced Concrete Beams," Sidney A. Guralnick (with discussion), 603.
Beams and Girders, Continuous
"Digital Computation for Stiffness Matrix Analysis," John S. Archer, 1.
"Elasti-Plastic Analysis of Continuous Frames and Beams," Lawrence P. Johnson, Jr., and Herbert A. Sawyer, Jr. (with discussion), 1176.
"Torque-Loaded Continuous Beams of Profile Section," Donovan H. Young and John F. Brahtz, 846.
Bridges
"Design Features of the George Washington Bridge Lower Deck," Irvine P. Gould, 1022.
Columns
"Lateral Bracing of Columns and Beams," George Winter (with discussion), 807.

STRUCTURES, THEORY OF (continued)
Concrete, Reinforced
"Concrete Beams and Columns with Bundled Reinforcement," Norman W. Hanson and Hans Reiffenstuhl (with discussion), 889.
"Strength of Reinforced Concrete Beams," Sidney A. Guralnick (with discussion), 603.
Dams
"Ambuklao Rock-Fill Dam, Design and Construction," E. Montford Rucik and Robert F. Edbrooke (with discussion), 1207.
"Arch Dams": A Symposium, Manuel Rocha, J. Laginha Serafim, and Antonio F. da Silveira; Carlo Semenza; and Dino Tonini (with discussion), 909.
"Underseepage Control at Fort Randall Dam," Stanley T. Thorfinnson, 792.
Earthquake Problems
"Earthquake Response of Elevated Tanks and Vessels," Donald F. Moran and James A. Cheney (with discussion), 503.
"Structural Dynamics in Earthquake-Resistant Design," John A. Blume (with discussion), 1088.
Foundations, Building
"Numerical Solutions for Beams on Elastic Foundation," Henry Malter (with discussion), 757.
Frames, Continuous
"Elasti-Plastic Analysis of Continuous Frames and Beams," Lawrence P. Johnson, Jr., and Herbert A. Sawyer, Jr. (with discussion), 1176.
Lock Gates
"Hydraulic Design of Columbia River Navigation Locks," George C. Richardson and Marvin J. Webster, 345.
Materials and Tests
"Garrison Dam Test Tunnel": A Symposium, Harris H. Burke, and Kenneth S. Lane (with discussion), 228.
"Inelastic Buckling in Steel," Geerhard Haaijer and Bruno Thurlimann (with discussion), 308.
Power Plants
"Containment Sphere for Dresden Station," Leonard P. Zick, James T. Dunn, and James B. Maher, 536.
Shell Structures
"Containment Sphere for Dresden Station, Leonard P. Zick, James T. Dunn, and James B. Maher, 536.
Wind Stresses
"Amplified Stress and Displacement in Guyed Towers," Robert S. Rowe (with discussion), 199.
STRUCTURES, TIMBER
"Factor of Safety in Design of Timber Structures," Lyman W. Wood, 1033.
Discussion: E. George Stern; Richard G. Kimbell; Emilio Rosenblueth; Ludvik Cizek; Milos Vorlicek; and Lyman W. Wood, 1045.
SURGES (Water Surface)
See WAVES
TANKS, OIL STORAGE
"Electric Pipeline for High-Viscosity Fuel," Albert G. Purdue, 644.
TANKS, SEDIMENTATION (sewage)
See also SETTLING BASINS (water supply)
"Hydrology of Urban Runoff," A. L. Tholin and Clint J. Keifer (with discussion), 1308.
TANKS, WATER
"Earthquake Response of Elevated Tanks and Vessels," Donald F. Moran and James A. Cheney (with discussion), 503.
TESTING STATIONS
See under relative subject, e.g., CONSTRUCTION
TESTS AND TESTING
See also BUCKLING; ELASTICITY; FAILURES . . .; MODELS . . .; SHEAR; STRENGTH OF MATERIALS; STRESS AND STRAIN; STRUCTURES, THEORY OF—Materials and Tests; *also* under material, structure, or structural part tested, e.g., DAMS; PIPELINES; TUNNELS
"Analytical and Experimental Study of Helicoidal Girders," Yee F. Young and Alexander C. Scordelis, 46.
"Pipeline Field Welding and Quality Control Methods," Armand G. Barkow, 417.
THERMAL POWER
See STEAM POWER (cross reference thereunder)
TIDES
See also OCEAN CURRENTS; WAVES
"Delta Project" A Symposium, Johannes B. Schijf; J. J. Dronkers; and H. A. Ferguson (with discussion), 1267.
"Forces Induced on a Large Vessel by Surge," John T. O'Brien and David I. Kuchenreuther (with discussion), 855.
"Stability of Coastal Inlets," Per Brun and Frans Gerritsen, 1228. *Discussion:* Robert E. Hickson, 1259.
"Water Forces on Accelerated Cylinders," Alan D. K. Laird, Charles A. Johnson, and Robert W. Walker, 652.
TIMBER AND TIMBERING
See aslo STRESS AND STRAIN—Timber; WOOD
"Factor of Safety in Design of Timber Structures," Lyman W. Wood (with discussion), 1033.
TIMBER STRUCTURES
See STRUCTURES, TIMBER

TORSION
"Analytical and Experimental Study of Helicoidal Girders," Yee F. Young and Alexander C. Scordelis, 46.
"Concrete Beams and Columns with Bundled Reinforcement," Norman W. Hanson and Hans Reiffenstuhl (with discussion), 889.
"Strength of Reinforced Concrete Beams," Sidney A. Guralnick (with discussion), 603.
"Torque-Loaded Continuous Beams of Profile Section," Donovan H. Young and John F. Brahtz, 846.
TOWERS
See also STRESS AND STRAIN—Towers
"Amplified Stress and Displacement in Guyed Towers," Robert S. Rowe (with discussion), 199.
TRAFFIC, BRIDGES
"Design Features of the George Washington Bridge Lower Deck," Irvine P. Gould, 1022.
TRAFFIC, HIGHWAY AND ROAD
See also HIGHWAYS AND ROADS—Location
"Freeways in Urban Planning," Harold M. Lewis (with discussion), 1072.
TRAFFIC, RIVER
"The Columbia River Controlled," Louis H. Foote, (with discussion), 583.
TRAFFIC, WATERWAY
"The Columbia River Controlled," Louis H. Foote (with discussion), 583.
TRUSSES (General)
See also BRIDGES; BRIDGES, TRUSS
"Construction of the Variable-Angle Launcher," Arthur C. Bravo, 181.
"Design Features of the George Washington Bridge Lower Deck," Irvine G. Gould, 1022.
TUNNEL LININGS
See also STRESS AND STRAIN—Tunnel Linings
"Garrison Dam Test Tunnel": A Symposium, Harris H. Burke, and Kenneth S. Lane (with discussion), 228.
TUNNELS (General)
"Garrison Dam Test Tunnel": A Symposium, Harris H. Burke, and Kenneth S. Lane, 228. *Discussion:* A. A. Eremin, 307.
TUNNELS, GAS
"Flow Testing by Ammonia Displacement," Jack N. White and Thomas Thawley, 673.
TURBULENCE (water agitation)
See FRICTION . . .; WATER, FLOW OF . . .
UNDERSEEPAGE
See SEEPAGE
URBAN . . .
See CITIES
VALVES
See also VALVES, GATE
"Hydraulic Design of Columbia River Navigation Locks," George C. Richardson and Marvin J. Webster, 345.
VESSELS
See SHIP . . .
VIBRATION
See also EARTHQUAKES; IMPACT
"Blast Phenomena from a Nuclear Blast," Ferd E. Anderson, Jr., 667.
"Digital Computation for Stiffness Matrix Analysis," John S. Archer, 1.
"Forces Induced on a Large Vessel by Surge," John T. O'Brien and David I. Kuchenreuther (with discussion), 855.
"Structural Dynamics in Earthquake-Resistant Design," John A. Blume (with discussion), 1088.
VIBRATION MEASURING INSTRUMENTS
"Forces Induced on a Large Vessel by Surge," John T. O'Brien and David I. Kuchenreuther (with discussion), 855.
VISCOSITY
"Flow Testing by Ammonia Displacement," Jack N. White and Thomas Thawley, 673.
WATER
"Water-A Limiting Resource," Robert O. Thomas, 101. *Discussion:* Douglas R. Woodward; Donald McCord Baker; Alfred R. Golze; and Robert O. Thomas, 112.
WATER . . .
See also GROUND WATER; RAINFALL
WATER ANALYSIS
See also WATER TREATMENT
"Meteoric Versus Nonmeteoric Ground Water," Harold E. Thomas and Donald E. White, 1304.
WATER CONSERVATION
See also COSTS, WATER CONSERVATION; PUBLIC WORKS; RESERVOIRS; WATER STORAGE
"The Columbia River Controlled," Louis H. Foote, (with discussion), 583.
"Lower-Cost Canal Lining Practice," Richard J. Willson, with discussion, 487.
WATER, CONSUMPTION OF (consumer usage)
See WATER, WASTE OF (cross reference thereunder)
WATER, CONSUMPTIVE USE OF (in agriculture)
"Water-A Limiting Resource," Robert O. Thomas (with discussion), 101.
"Meteoric Versus Nonmeteoric Ground Water," Harold E. Thomas and Donald E. White, 1304.
WATER, CONSUMPTIVE USE OF (in industry)
"Water-A Limiting Resource," Robert O. Thomas (with discussion), 101.

WATER, DEMINERALIZATION OF
See WATER TREATMENT
WATER DIVERSION
See also FLOOD ROUTING
"Hydrology of Urban Runoff," A. L. Tholin and Clint J. Keifer (with discussion), 1308.
WATER, DUTY OF
"The Columbia River Controlled," Louis H. Foote (with discussion), 583.
WATER FLOW ANALYSIS
"Use of Models to Study Ground-Water Problems," Kenneth R. Wright, 133.
WATER, FLOW OF (General)
See also FLOODS; GROUND WATER; MODELS, HYDRAULIC; SPILLWAYS; TURBULENCE (cross references thereunder)
"The Columbia River Controlled," Louis H. Foote (with discussion), 583.
"Resistance Properties of Sediment-Laden Streams," Vito A. Vanoni and George N. Nomicos (with discussion) 1140.
"Self-Aerated Flow in Open Channels," Lorenz G. Straub and Alvin G. Anderson (with discussion), 456.
WATER, FLOW OF, IN OPEN CHANNELS
See also DROP-DOWN; SEDIMENT AND SEDIMENTATION; SILT AND SILTING, CHANNEL
"Resistance Properties of Sediment-Laden Streams," Vito A. Vanoni and George N. Nomicos (with discussion) 1140.
"Self-Aerated Flow in Open Channels," Lorenz G. Straub and Alvin G. Anderson, 456. *Discussion:* Michele Viparelli; and Lorenz G. Straub and Alvin G. Anderson, 482.
"Sleuthing the Behavior of a River," Edward J. Cleary, (with discussion), 1053.
"Stability of Coastal Inlets," Per Brun and Frans Gerritsen (with discussion), 1228.
WATER, FLOW OF, OVER DAMS AND WEIRS
"Self-Aerated Flow in Open Channels," Lorenz G. Straub and Alvin G. Anderson (with discussion), 456.
WATER LEVEL RECORDING AND INDICATING INSTRUMENTS
"Sleuthing the Behavior of a River," Edward J. Cleary (with discussion), 1053.
"Water Forces on Accelerated Cylinders," Alan D. K. Laird, Charles A. Johnson, and Robert W. Walker, 652.
WATER POLLUTION (General)
See also COSTS, WATER POLLUTION CONTROL
"Sleuthing the Behavior of a River," Edward J. Cleary (with discussion), 1053.
WATER POWER (General)
See also COSTS, WATER POWER; DAMS; POWER
"Ambuklao Rock-Fill Dam, Design and Construction," E. Montford Fucik and Robert F. Edbrooke (with discussion), 1207.
WATER PRESSURE
See also GAGES, PRESSURE; WAVES
"Forces Induced on a Large Vessel by Surge," John T. O'Brien and David Kuchenreuther (with discussion), 855.
"Water Forces on Accelerated Cylinders," Alan D. K. Laird, Charles A. Johnson, and Robert W. Walker, 652.
WATER SPREADING
See SPREADING, WATER
WATER STORAGE
See also RESERVOIRS . . . ; TANKS . . . ; WATER CONSERVATION
"The Columbia River Controlled," Louis H. Foote (with discussion), 583.
"Distribution of Sediment in Large Reservoirs," Whitney M. Borland and Carl M. Miller, 166.
"Hydrology of Urban Runoff," A. L. Tholin and Clint J. Keifer (with discussion), 1308.
WATER STORAGE (RESERVOIRS, MULTI-PURPOSE)
See also RESERVOIRS . . .
"Distribution of Sediment in Large Reservoirs," Whitney M. Borland and Carl R. Miller, 166.
WATER SUPPLY (General)
See also DAMS . . . ; GROUND WATER; RAINFALL; WELLS
"Meteoric Versus Nonmeteoric Ground Water," Harold E. Thomas and Donald E. White, 1304.
"Underseepage Control at Fort Randall Dam," Stanley T. Thorfinnson, 792.
"Use of Models to Study Ground-Water Problems," Kenneth R. Wright, 133.
WATER TANKS
See TANKS, WATER
WATER TOWERS
See TANKS, WATER
WATER TREATMENT
See also WATER ANALYSIS
"Meteoric Versus Nonmeteoric Ground Water," Harold E. Thomas and Donald E. White, 1304.
WATER, WASTE OF
See WATER, CONSUMPTIVE USE OF
WATERWAYS (General)
See also CHANNELS; HARBORS; RIVERS
"Stability of Coastal Inlets," Per Brun and Frans Gerritsen (with discussion), 1228.
WAVE RECORDING AND RECORDING APPARATUS
"Forces Induced on a Large Vessel by

WAVE RECORDING AND RECORDING APPARATUS (continued)
Surge," John T. O'Brien and David I. Kuchenreuther (with discussion), 855.
"Selection of Design Wave for Offshore Structures," Charles L. Bretschneider (with discussion), 388.
"Water Forces on Accelerated Cylinders," Alan D. K. Laird, Charles A. Johnson, and Robert W. Walker, 652.
WAVES
See also EROSION, BEACH; OCEAN CURRENTS; RETAINING WALLS; SEA WALLS; SHORES AND SHORE PROTECTION; TIDES; WATER PRESSURE
"Delta Project": A Symposium, Johannes B. Schijf; J. J. Dronkers; and H. A. Ferguson (with discussion), 1267.
"Forces Induced on a Large Vessel by Surge," John T. O'Brien and David I. Kuchenreuther, 855. *Discussion:* Basil W. Wilson, 877.
"Selection of Design Wave for Offshore Structures," Charles L. Bretschneider, 388. *Discussion:* J. E. Chappelear; and Charles Bretschneider, 414.
"Stability of Coastal Inlets," Per Brun and Frans Gerritsen (with discussion), 1228.
"Water Forces on Accelerated Cylinders," Alan D. K. Laird, Charles A. Johnson, and Robert W. Walker, 652.
WELDED JOINTS
See JOINTS, WELDED
WELDS AND WELDING
See also JOINTS, WELDED
"Pipeline Field Welding and Quality Control Methods," Armand G. Barkow, 417.
"Welded Pipeline Branch Connections," Everett C. Rodabaugh and Henry H. George, 554.
WELLS
See also GROUND WATER
"Underseepage Control at Fort Randall Dam," Stanley T. Thorfinnson, 792.
WHARVES
"Forces Induced on a Large Vessel by Surge," John T. O'Brien and David I. Kuchenreuther (with discussion), 855.
WIND
See also WAVES
"Selection of Design Wave for Offshore Structures," Charles L. Bretschneider (with discussion), 388.
WIND BRACING
"Lateral Bracing of Columns and Beams," George Winter (with discussion), 807.
WIND PRESSURE
See also STRUCTURES, THEORY OF—Wind Stresses
"Amplified Stress and Displacement in Guyed Towers," Robert S. Rowe (with discussion).
WOOD
See also STRESS AND STRAIN—Wood; TIMBER . . .
"Factor of Safety in Design of Timber Structures," Lyman W. Wood (with discussion), 1033.
ZONING
See also CITIES; CITY PLANNING; REGIONAL PLANNING
"Freeways in Urban Planning," Harold M. Lewis (with discussion), 1072.

AUTHOR INDEX

(including Memoirs of deceased members)

ADAMS, M.
Earthquake-resistant design, 1126.
AHLVIN, RICHARD G.
Clay strength, 161.
ALLING, ARTHUR RICH
Memoir of, 1395.
ANDERSON, ALVIN G.
"Self-Aerated Flow in Open Channels," 456.
ANDERSON, FERD E.
"Blast Phenomena from a Nuclear Burst," 667.
ARCHER, JOHN S.
"Digital Computation for Stiffness Matrix Analysis," 1.
ARMENTROUT, CHARLES L.
Urban runoff, 1365.
AUGUSTI, GUILIANO
Elasti-plastic analysis, 1192.
BAKER, DONALD McCORD
Water, 114.
BALAZS, GEORGE
Shear strength, 635.
BARKER, CLIFTON THORNE
Memoir of, 1395.
BARKOW, ARMAND G.
"Pipeline Field Welding and Quality Control Methods," 417.
BATES, JOHN SCHUYLER
Memoir of, 1396.
BAUMGARTNER, JOHN ALBERT
Memoir of, 1397.
BERGMAN, VICTOR R.
Numerical methods, 789.
BERRITSEN, FRANS
"Stability of Coastal Inlets," 1228.
BERTERO, VITELMO
Towers, 215.
BESSEY, ROY
Columbia River, 597.
BIJLAARD, P. P.
Buckling, 338.
BINDER, REUBEN W.
Earthquake-resistant design, 1128.
BIRMAN, JOSEPH H.
Vermilion dam, 93.
BLISS, TULLA ETHAN
Memoir of, 1397.
BLUME, JOHN A.
"Structural Dynamics in Earthquake Resistant Design," 1088.
BOCK, PAUL
Urban runoff, 1361.
BOESEL, RONALD AXEL
Memoir of, 1398.
BORLAND, WHITNEY M.
"Distribution of Sediment in Large Reservoirs," 166.
BOSIER, WILLIAM HARRIS
Memoir of, 1399.
BRAHTZ, JOHN F.
"Torque-Loaded Continuous Beams of Profile Section," 846.
BRANDT, RICHARD LUDWIG
Memoir of, 1399.
BRAVO, ARTHUR C.
"Construction of the Variable-Angle Launcher," 181.
BRETSCHNEIDER, CHARLES L.
"Selection of Design Wave for Offshore Structures," 388.
BRUMLEY, DANIEL JOSEPH
Memoir of, 1400.
BRUNN, PER
"Stability of Coastal Inlets," 1228.
BURKE, HARRIS H.
"Garrison Dam Test Tunnel (Symposium): Investigation and Construction," 230.
CALAHAN, PECOS HILL
Memoir of, 1401.
CHAPPELAR, J. E.
Design wave, 414.
CHENEY, JAMES A.
"Earthquake Response of Elevated Tanks and Vessels," 503.
CHIBARO, ANTHONY A.
Lateral bracing, 826.
CHOU, TSUNG-LIEN
Resistance properties, 1168.
CHU, KUANG-HAN
Shear strength, 636.
CIZEK, LUDVIK
Timber structures, 1048.
CLEARY, EDWARD J.
"Sleuthing the Behavior of a River," 1053.
COWAN, HENRY J.
Shear strength, 633.
CRAFT, WELLING HALL
Memoir of, 1401.
CROCKER, FRED WILBUR
Memoir of, 1402.
CUMMINGS, EDWARD M.
"Cellular Cofferdams and Docks," 13.
CUNNINGHAM, JOHN WILBUR
Memoir of, 1403.
da SILVEIRA, ANTONIO F.
"Arch Dams (Symposium): Design and Observation in Portugal," 911.

DE GUENIN, JACQUES
"Clay Strength Increase Caused by Repeated Loading," 141.
DICKINSON, MAURICE L.
Vermilion dam, 86.
DIETERICH, BERNARD H.
River behavior, 1066.
DODGE, ALEXANDER
Numerical methods, 774.
DOUGHERTY, STARKS CONRAD
Memoir of, 1404.
DRONKERS, J. J.
"Tidal Computations in Coastal Areas," 1281.
DRUML, FRANK V.
"Hydraulic Problem Solution on Electronic Computers," 517.
DUNN, JAMES T.
"Containment Sphere for Dresden Station," 536.
EDBROOKE, ROBERT F.
"Ambuklao Rock-Fill Dam, Design and Construction," 1207.
ELLIOTT, JOHN ARTHUR
Memoir of, 1404.
EREMIN, A. A.
Earthquake-resistant design, 1124.
Earthquake response, 515.
Elasti-plastic analysis, 1202.
Garrison Dam, 307.
Partial moments, 452.
ERZEN, CEVDET Z.
Cellular cofferdams, 37.
FERGUSON, H. A.
"Hydraulic Investigations for the Delta Project," 1290.
FISH, GILBERT DUDLEY
Memoir of, 1405.
FLOYD, EARL NESBY
Memoir of, 1406.
FOOTE, LOUIS H.
"The Columbia River Controlled," 583.
FRASER, CHARLES E.
Memoir of, 1406.
FREITAG, DEAN R.
Compacted clay, 714.
FUCIK, E. MONTFORD
"Ambuklao Rock-Fill Dam, Design and Construction," 1207.
GAMMIE, ROBERT JAMES
Memoir of, 1407.
GEORGE, HENRY H.
"Welded Pipeline Branch Connections," 554.
GLOVER, ROBERT E.
Arch dams, 949.
GOETZ, CHARLES
Memoir of, 1408.
GOLZE, ALFRED R.
Water, 117.
GOSCHY, BELA
Shear strength, 635.
GOULD, IRVINE P.
"Design Features of the George Washington Bridge Lower Deck," 1022.
GREEN, GILES G.
Lateral bracing, 827.
GURALNICK, SIDNEY A.
"Strength of Reinforced Concrete Beams," 603.
HAAIJER, GEERHARD
"Inelastic Buckling in Steel," 308.
HABER, RICHARD A.
Freeways, 1081.
HADLEY, HOMER M.
Bundling, 905.
HALL, JAMES W.
Trends in Pipeline Construction," 123.
HANSON, NORMAN W.
"Concrete Beams and Columns with Bundled Reinforcement," 889.
HATCH, ARTHUR SELDEN
Memoir of, 1409.
HAWXHURST, ROBERT, JR.
Memoir of, 1409.
HELLAND, RANDOLPH OLAF
Memoir of, 1410.
HERROLD, GEORGE H.
Freeways, 1083.
HEYMAN, SAMUEL
Cellular cofferdams, 34.
HICKSON, ROBERT E.
Coastal inlets, 1259.
HOLMAN, CHARLES O., JR.
Memoir of, 1411.
HOTES, FREDERICK L.
Canal lining, 487.
HOUCK, FRED A.
Arch dams, 950.
HUNTER, ROBERT CHARLES
Memoir of, 1411.
IZZARD, CARL F.
Urban runoff, 1365.
JACOBSEN, LYDIK S.
Earthquake-resistant design, 1122.
JOHNSON, CHARLES A.
"Water Forces on Accelerated Cylinders," 652.
JOHNSON, LAWRENCE P.
"Elasti-Plastic Analysis of Continuous Frames and Beams," 1176.
JOHNSTON, BRUCE G.
Lateral bracing, 830.
KALD, LEMBIT
Partial moments, 453.
KEIFER, CLINT J.
"Hydrology of Urban Runoff," 1308.
KENNEY, T. CAMERON
Glacial lake clays, 1012.
KIELY, JOHN R.
Vermilion dam, 88.
KIMBELL, RICHARD G.
Timber structures, 1045.
KING, HOWARD LANGDON
Memoir of, 1412.

KOLIBAL, JOSEPH T.
Partial moments, 451.
KRYNINE, D. P.
Compacted clay, 712.
KUCHENREUTHER, D. I.
"Forces Induced on a Large Vessel by Surge," 855.
LAHOZ, JOSE O.
Ambuklao dam, 1223.
LAIRD, D. K.
"Water Forces on Accelerated Cylinders," 652.
LAMBE, WILLIAM T.
"Compacted Clay (Symposium): Engineering Behavior," 718.
"Compacted Clay (Symposium): Structure," 682.
LANE, KENNETH S.
"Garrison Dam Test Tunnel (Symposium): Evaluation of Test Results," 268.
LARSON, MARVIN A.
Lateral bracing, 830.
LAURSEN, EMMETT M.
Resistance properties, 1167.
LAVERTY, BRUCE R.
Vermilion dam, 94.
LAWLER, EDWARD A.
"Hydraulic Problem Solution on Electronic Computers," 517.
LAWTON, FREDERIC L.
Ambuklao dam, 1222.
LEONARDS, GERALD A.
Compacted clay, 709.
LEPS, THOMAS M.
"Design and Performance of Vermilion Dam," 63.
LEVANDER, CARL GUSTAF
Memoir of, 1413.
LEWIS, FRANK REDMOND
Memoir of, 1414.
LEWIS, HAROLD M.
"Freeways in Urban Planning," 1072.
LILLY, WALTER HARRISON
Memoir of, 1414.
LIVINGSTON, PENN POORE
Memoir of, 1415.
LOWRY, ROBERT LEE
Memoir of, 1416.
LUCCHETTI, RAUL JOSE FELIX
Memoir of, 1417.
LUND, ALFRED MAJENDIE
Memoir of, 1417.
MAHER, JAMES B.
"Containment Sphere for Dresden Station," 536.
MALTER, HENRY
"Numerical Solutions for Beams on Elastic Foundations," 757.
"Numerical Solutions for Interconnected Bridge Girders," 365.
MARSTON, FRANK A.
"Annual Address at the Convention, Reno, Nevada, June 22, 1960," 1380.
MATHEWS, CLAUDE KELSEY
Memoir of, 1418.
McCRONE, ROSSITER MAGERS
Memoir of, 1419.
McDONNELL, ROBERT EMMETT
Memoir of, 1419.
McFARLAND, FRANK RAY
Memoir of, 1420.
McNEILL, ROBERT L.
"Clay Strength Increase Caused by Repeated Loading," 141.
McPHERSON, M. B.
Urban runoff, 1357.
MILLER, CARL R.
"Distribution of Sediment in Large Reservoirs," 166.
MILLER, WILLIAM J., JR.
Freeways, 1081.
MONNICHE, TOLLEF BACHE
Memoir of, 1421.
MORAN, DONALD F.
"Earthquake Response of Elevated Tanks and Vessels," 503.
MORE, PHILLIP DANIEL
Memoir of, 1421.
MORRISS, GROVER CLEVELAND
Memoir of, 1422
MURPHY, MICHAEL J.
Earthquake-resistant design, 1126.
NEEDHAM, LAWRENCE KENNETH
Memoir of, 1423.
NEFF, STEWART SMITH
Memoir of, 1423.
NIKIRK, FRANK AUSTIN
Memoir of, 1424.
NOMICOS, GEORGE N.
"Resistance Properties of Sediment-Laden Streams," 1167.
O'BRIEN, J. T.
"Forces Induced on a Large Vessel by Surge," 855.
PAIGE, CLAYTON WHITNEY
Memoir of, 1425.
PHILO, CLIFFORD ALLEN
Memoir of, 1425.
POSNER, HARRY
"Moments in Beams by the Method of Partial Moments," 430.
PRICHARD, GEORGE WILLIAM
Memoir of, 1426.
PROCTOR, ASA GLISSON
Memoir of, 1427.
PURDUE, ALBERT G.
"Electric Pipeline for High-Viscosity Fuel," 644.
REDDY, DRONNADULA V.
Bridge girders, 383.
REED, CHARLES ALLEY
Memoir of, 1428.
REESE, LYMON C.
Numerical methods, 786.
REIFFENSTUHL, HANS
"Concrete Beams and Columns with Bundled Reinforcement," 889.

RENZULLI, TULLIO
Elasti-plastic analysis, 1194.
RICHARDSON, EVERETT V.
Resistance properties, 1170.
RICHARDSON, GEORGE C.
"Hydraulic Design of Columbia River Navigation Locks," 345.
ROCHA, MANUEL
"Arch Dams (Symposium): Design and Observation in Portugal," 911.
RODABAUGH, EVERETT C.
"Welded Pipeline Branch Connections," 554.
ROSENBLUETH, EMILIO
Earthquake-resistant design, 1124.
Timber structures, 1046.
ROWE, ROBERT S.
"Amplified Stress and Displacement in Guyed Towers," 199.
RUSSELL, GARFIELD HUGH
Memoir of, 1428.
RYKER, NORMAN J.
Numerical methods, 770.
SALAS, JOSE A. JIMENEZ
Compacted clay, 746.
SAWYER, HERBERT A., JR.
"Elasti-Plastic Analysis of Continuous Frames and Beams," 1176.
SCHEER, ALFRED C.
Compacted clay, 741.
SCHIJF, JOHANNES B.
"Generalities on Coastal Processes and Protection," 1268.
SCHULZ, WALTER FREDERICK
Memoir of, 1429.
SCORDELIS, ALEXANDER C.
"Analytical and Experimental Study of Helicoidal Girders," 46.
SEED, H. BOLTON
"Clay Strength Increase Caused by Repeated Loading," 141.
SEELYE, ELWYN E.
Memoir of, 1430.
SEMENZA, CARLO
"Arch Dams (Symposium): Development in Italy," 954.
SERAFIM, J. LAGINHA
"Arch Dams (Symposium): Design and Observation in Portugal," 911.
SHACKELFORD, WILLIAM JAMES
Memoir of, 1431.
SHEDD, THOMAS CLARK
Memoir of, 1431.
SHEETZ, JACK WILLIAM
Memoir of, 1432.
SHERRILL, CLARENCE OSBORNE
Memoir of, 1433.
SILVESTER, RICHARD
Delta project, 1278.
SIMONS, DARYL B.
Resistance Properties, 1170.
SINGLETON, MICAJAH THOMAS
Memoir of, 1433.
SKINNER, R. IVAN
Earthquake-resistant design, 1126.
SPENCER, RALPH W.
Vermilion dam, 89.
STERN, E. GEORGE
Timber structures, 1045.
STILES, ARTHUR ALVORD
Memoir of, 1434.
STRAUB, LORENZ G.
"Self-Aerated Flow in Open Channels," 456.
STREIFF, ABRAHAM
Memoir of, 1435.
SYLLIAASEN, MELVIN OLIVER
Memoir of, 1436.
TERZAGHI, KARL
"Design and Performance of Vermilion Dam," 63.
THAWLEY, THOMAS
"Flow Testing by Ammonia Displacement," 673.
THOLIN, A. L.
"Hydrology of Urban Runoff," 1308.
THOMAS, HAROLD E.
"Meteoric Versus Nonmeteoric Ground Water," 1304.
THOMAS, ROBERT O.
"Water—A Limiting Resource," 101.
THORFINNSON, STANLEY T.
"Underseepage Control at Fort Randall Dam," 792.
THURLIMANN, BRUNO
"Inelastic Buckling in Steel," 308.
TONINI, DINO
"Arch Dams (Symposium): Observed Behavior in Italy," 974.
TROLLOPE, D. HUGH
Clay strength, 163.
Compacted clay, 706, 753.
TROST, ADOLPHUS GUSTAVUS
Memoir of, 1436.
TURNBULL, J. MacNEIL
Compacted clay, 743.
UHRIG, LEO VERNON
Memoir of, 1437.
VANONI, VITO A.
"Resistance Properties of Sediment-Laden Streams," 1140.
VAWTER, JAMISON
Memoir of, 1438.
VIPARELLI, MICHELE
Self-aerated flow, 482.
VORLICEK, MILOS
Timber structures, 1049.
WAI, FRANCIS K.
Memoir of, 1439.
WALKER, GEORGE E.
River behavior, 1070.
WALKER, ROBERT W.
"Water Forces on Accelerated Cylinders," 652.
WALKER, WILLIAM S.
Partial moments, 451.

WARD, RICHARD BENSKIN
Memoir of, 1439.
WARKENTIN, BENNO
Compacted clay, 707, 742.
WARNER, ROBERT F.
Shear strength, 634.
WEBSTER, MARVIN J.
"Hydraulic Design of Columbia River Navigation Locks," 345.
WEST, PHILLIP J.
Vermilion dam, 90.
WHITE, DONALD E.
"Meteoric Versus Nonmeteoric Ground Water," 1304.
WHITE, JACK N.
"Flow Testing by Ammonia Displacement," 673.
WHITTED, LEVI ROMULUS
Memoir of, 1440.
WILKINSON, JACKSON HEATH
Memoir of, 1441.
WILLIS, JOSEPH
Urban runoff, 1357.
WILLSON, RICHARD J.
"Lower-Cost Canal Lining Practice," 487.
WILSON, BASIL W.
Surge forces, 877
WINCHESTER, THOMAS H.
Memoir of, 1441.
WINTER, GEORGE
"Lateral Bracing of Columns and Beams," 807.
WISE, WHITBY FOSTER
Memoir of, 1442.
WITHOLDER, ALFRED HENRY
Memoir of, 1443.
WOLF, PETER O.
Urban runoff, 1355.
WOOD, LYMAN W.
"Factor of Safety in Design of Timber Structures," 1033.
WOODWARD, DOUGLAS R.
Water, 112.
WRIGHT, KENNETH R.
"Use of Models to Study Ground-Water Problems," 133.
WU, TIEN H.
"Geotechnical Properties of Glacial Lake Clays," 994.
YONG, RAYMOND N. Y.
Compacted clay, 707, 742.
YOUNG, ALEXANDER RIRIE
Memoir of, 1444.
YOUNG, DONOVAN H.
"Torque-Loaded Continuous Beams of Profile Section," 846.
YOUNG, YEE F.
"Analytical and Experimental Study of Helicoidal Girders," 46.
ZICK, LEONARD P.
"Containment Sphere for Dresden Station," 536.